

WHAT IS CLAIMED IS:

1. A method of storing substantial data integrating  
shape and physical properties, characterized by comprising an  
5 external data input step (A) for inputting external data (12)  
consisting of boundary data of an object (1), an Octree  
division step (B) for dividing, by Octree division, the  
external data into cubical cells (13) which boundary surfaces  
are orthogonal to each other, and a cell data storage step  
10 (C) for storing the values of various physical properties for  
each of the cells.

2. The method of storing substantial data  
integrating shape and physical properties according to claim  
15 1, wherein in said Octree division step (B), each of the  
divided cells is classified to internal cells (13a) located  
in the interior of the object and boundary cells (13b)  
including boundary surfaces.

3. The method of storing substantial data  
integrating shape and physical properties according to claim  
20 2, wherein said boundary cells (13b) is re-divided by the  
Octree division until acquiring cut points enough to enable  
the reconstruction of boundary shape elements including the  
25 boundary surfaces included in the external data.

4. The method of storing substantial data

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integrating shape and physical properties according to claim  
2, wherein said internal cell (13a) has one kind of physical  
property value as its attribute, and the boundary cell (13b)  
has two kinds of physical property values of the interior and  
5 outside of the object.

5. The method of storing substantial data  
integrating shape and physical properties according to claim  
1, wherein said physical property values consist of constant  
10 values which do not change by simulation, and variables which  
change as a result of simulation.

6. The method of storing substantial data  
integrating shape and physical properties according to claim  
15 1, wherein the external data (12) is polygon data  
representing a polyhedron, a tetrahedron or hexahedron  
element for a finite-element method, curved surface data for  
a three dimensional CAD or CG tool, or data for representing  
the surface of another solid as information comprising  
20 partial planes and curved surfaces.

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